

NOTES CONCERNING MEXICAN SALDIDAE, INCLUDING THE DESCRIPTION OF TWO NEW SPECIES (HEMIPTERA)

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ABSTRACT.— A complete description and discussion of the genus *Enalosalda* Polhemus is given, and the males of *E. mexicana* Van Duzee and *Saldula hispida* are described. *Saldula saricola* and *Saldula durangoana* are described as new. *Saldula suttoni* Drake and Hussey is transferred to *Ioscytus* (n. comb.); *Salda hispida* Hodgden is considered a subspecies (n. comb.) of *Saldula sulcicollis* Champion.

The new taxa and nomenclatural changes proposed here have resulted from a comprehensive study of Mexican Saldidae. As the larger work may not be published for some time, it seems advisable to make this information available to other workers.

The work upon which this paper is based was supported in part by a grant from the University of Colorado Museum.

The specimens utilized are primarily from the Polhemus collection (JTP) and the University of Colorado Museum Collections (CU). A small amount of additional material was borrowed from Texas A & M University (TAM), the California Academy of Sciences (CAS), and the University of Michigan (UM); and I am indebted to J. C. Schaffner, P. H. Arnaud, and T. E. Moore respectively for their help in this regard.

The genus *Enalosalda* Polhemus was recently named in a paper by Polhemus and Evans (1969); however, a complete description and discussion were inappropriate in that paper and are given below.

Enalosalda Polhemus

Enalosalda Polhemus, 1969, in Polhemus and Evans, *Pacific Insects* 11:575.

Hemelytra with membrane not differentiated from corium except at inner margin; cell pattern variable, usually indistinct. Hind wings reduced to small, membranous strips. Female ovipositor short, broad, normally with six small teeth. Tube leading from spermatheca bulb with tapering walls, thinning toward apex, without flange. Larval organ absent. Ocelli, measured from center, equidistant from each other and inner margins of eyes.

All other generic characters typical of the Chiloxanthinae (Coben, 1959), i.e., base of filum gonopori forming one closed ring, median sclerotized structure of aedeagus paired, apicolateral structure of aedeagus absent, posterior margin of female subgenital plate truncate with hind margin weakly indented, head without postclypeus. (The ductus ejaculatorius has not been studied.) This genus falls in the subfamily Chiloxanthinae.

Type species: *Orthophrys mexicanus* Van Duzee, 1923.

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DISCUSSION.— Van Duzee (1923) described *mexicanus* from a single female taken under kelp on Angel de la Guardia Island in the Gulf of California and placed it in the genus *Orthophrys*. Its generic position was considered by Drake and Hoberlandt (1950), who placed it in *Pentacora*, and later Drake and Hottes (1954) figured the type and published a note on it. Recently, Lattin and Cobben (1969) reexamined the type and tentatively assigned the species to *Pentacora*; however, the rediscovery of the species at Guaymas, Sonora, Mexico, has permitted the examination of a long series, and I concluded that the taxon represents a distinct genus, hence the name and a brief diagnosis were recently published (Polhemus and Evans, 1969). Table 1 gives a comparison between *Enalosalda* and the other genera in the Chiloxanthinae of which females were available. (Only a single male of *Pelachoris leucographa* [Rimes] was studied, but it and Drake's description [1962] indicate that *Pelachoris* is a fairly typical member of the subfamily.)

Enalosalda is divergent from other Chiloxanthinae, as it lacks some of the specialized structures of *Pentacora*, *Chiloxanthus*, and *Paralosalda*. The great reduction of flight (metathoracic) wings and lack of larval organs could be interpreted as an indicator of the age of split off of *Enalosalda* from the rest of the subfamily, which is a fairly homogeneous unit with the exception of the annectant *Paralosalda*. Flight wings are of high importance to many saldids, and only those species occupying stable ecological situations over a long time period are likely to lose the ability to fly. Even then, many brachypterous forms retain relatively well-developed posterior

Table 1. Comparison of the genera of Chiloxanthinae.

<i>Enalosalda</i>	<i>Paralosalda</i>	<i>Pentacora</i> , <i>Chiloxanthus</i>
Spermatheca tube leading from bulb having tapering walls. Ovipositor short, having six small teeth and no well-developed ridges.	Spermatheca tube leading from bulb having tapering walls. Ovipositor of moderate length, having 8 well-developed teeth. Ridges along ovipositor well developed.	Spermatheca tube with thickened structure (flange) at terminus. Ovipositor long, with 13-14 well-developed teeth. Ridges along ovipositor well developed.
Flight (metathoracic) wings vestigial, being reduced to small membranous strips.	Flight wings well developed.	Flight wings more or less well developed, nearly attaining apex of hemelytra in all species.
Female hemelytra with only slight modification to receive male coupling plate, the modification being a glabrous area with a few erect hairs on the underside of embolium.	Female hemelytra modified to receive male coupling plate.	Female hemelytra always modified to some degree to receive male coupling plate; at least a thickening of the embolar region.
Larval organ absent. Intertidal.	Larval organ present. Intertidal.	Larval organ present. Littoral or inland.

wings, although a reduction in hind wing structure, similar to that in *Enalosalda*, is seen in some other saldids colonizing the ocean shore (i.e., *Orthophrys* and *Halosalda*), and in the intertidal *Omania* they are absent. The parallelism between *Enalosalda* and *Orthophrys* has been discussed at length in another paper (Lattin and Cobben, loc. cit.). The lack of a flange on the spermatheca is a character of unknown significance; however, in his studies of the female genitalia of the Heteroptera, Pendergrast (1957) stated that for the Saldidae a single deep pump flange exists. The species that he studied were *Saldula saltatoria* (L.) and *Salda littoralis* (L.). Concerning the Heteroptera as a whole, he states that the spermatheca may possibly be of use at the generic level of classification. The species studied by this author in the Chloxanthinae, other than *Enalosalda*, all possess the flange.

The reduced ovipositor structure, tending toward the mesoveliid type, may have resulted from laying eggs in rock crevices or soft material rather than in plant stems. While the eggs have not been found, the habitat surrounding the intertidal rocks, in which these bugs were studied, provided no visible terrestrial plant life that could be used for egg deposition. Also, nymphs of almost all instars were found in the intertidal zone.

I am indebted to G. G. E. Scudder for studying the female genitalia in detail. His figures (1A and B) are reproduced here, and the nomenclature is that of Scudder (1959, 1961). His comments, in part, are: "It seems to me that this is a fairly typical saldid, both in external structure and detail. . . . The attachment of the gonoplas is a little different to that I have studied in *Salda* and *Saldula*: The 'connecting piece' is quite free in your new genus and not in *Salda* and *Saldula*."

As the same condition of the "connecting piece" is found in *Pentacora signoreti* Guerin, it is possible that this character may be typical of the subfamily Chloxanthinae; however, in *Paralosalda* it is not free. The figure by Drake and Hottes (1954) does not properly depict the antenna of *Enalosalda mexicana*, and as no male has been available until the present series came to hand, a re-description of the species follows. The type, a female, has been studied.

Enalosalda mexicana (Van Duzee)

Orthophrys mexicana: Van Duzee, 1923, Proc. Calif. Acad. Sci. 12:165 (Type: Puerto Refugio, Angel de la Guardia Island, Gulf of California, Mex.; Calif. Acad. Sci. type no. 1045).

Pentacora mexicana: Drake and Hoberlandt, 1950, Acta Ent. Mus. Nat. Pragae 26:5.

Pentacora mexicana: Drake and Hottes, 1954, Occ. Papers Mus. Zool., Univ. Mich. 553:5.

Pentacora mexicana: Lattin and Cobben, 1968, Ent. Berichten. 28:130.

Enalosalda mexicana: Polhemus and Evans, 1969, Pacific Insects 11:575.

COLORATION.— Head, pronotum, scutellum, sutures of thoracic venter, hemelytral markings and veins, dorsal surface of antennal

segment 1 and all of segments 3 and 4 brown to deep brown; small spot either side of vertex of head, elongate area along inner margin of each eye, medial spot on frons and apex of frons, rostrum, anteclypeus, labrum, broad areas along lateral pronotal margins, narrow area caudad from collar, two triangular pronotal spots adjacent to anterior femora, dorsal surface of middle and hind femora, apices of tibia, tarsi ochreous; hemelytral ground color flavous to ochreous; thoracic underparts leucine; legs, coxae, tibia luteous; antennal segment 2 luteous, becoming lighter distally; femora luteous, knees lighter.

HEAD.— Shining, frons and vertex rugulose. The elongate ochreous areas along eyes interrupted by a dark brown sulcus starting between ocelli and eye and extending anterolaterally almost to eye, deeper ahead of ocelli; rostrum reaching between hind coxae; ocelli equidistant from each other and eyes; with usual three pairs of trichobothria.

THORAX.— Pronotum shining, rugulose; anterior lobe scarcely raised, weakly differentiated from posterior lobe; with broad depression medially and a depression on each side of middle caudad of medial depression; lateral margins straight, angles rounded, anterior width slightly less than eyes, posterior width/anterior width, 60/43; posterior lobe/anterior lobe, 5/16; width/median length, 60/21; posterior margin slightly indented over scutellum. Scutellum width/length, 21/26.

WINGS.— Hemelytra semi-brachypterous; broad, irregular spots along margin two-fifths and three-fifths of the distance from base to apex, a smaller spot four-fifths toward apex, irregular spots on inner corium one-third and two-thirds toward apex, and at apex, irregular, elongate brown areas along vestigial claval suture on both inner corium and clavus and along margin of scutellum on clavus; clavus fused to corium, vestigial suture ochreous; membrane largely wanting, existing narrowly from apex of claval commissure to apex of hemelytra, remainder of hemelytra rather uniformly coriaceous; cell structure indistinct, apparently with three cells; flight wings vestigial, consisting of short membranous strips (Fig. 2).

EXTREMITIES.— Antennal segments clothed with short, dark hairs and scattered longer hairs; proportions (60 units = 1 mm) I, 16; II, 32; III, 26; IV, 29. Tibiae and tarsi with usual scattered dark spines; all leg structures covered with semi-long light brown hairs.

GENITAL STRUCTURES.— Parandria, paramere, sclerotized structures of aedeagus, filum gonopori, and coupling plate as shown in Fig. 1C, E, F, G, H, and I.

SIZE.— Length 2.7 mm, width 1.4 mm.

FEMALE.— Similar to male, but slightly larger (see table); subgenital plate truncate (Fig. 1D). Hemelytra with polished area on underside of embolium about two-thirds toward apex from base, polished area having several short decumbent hairs directed caudad.

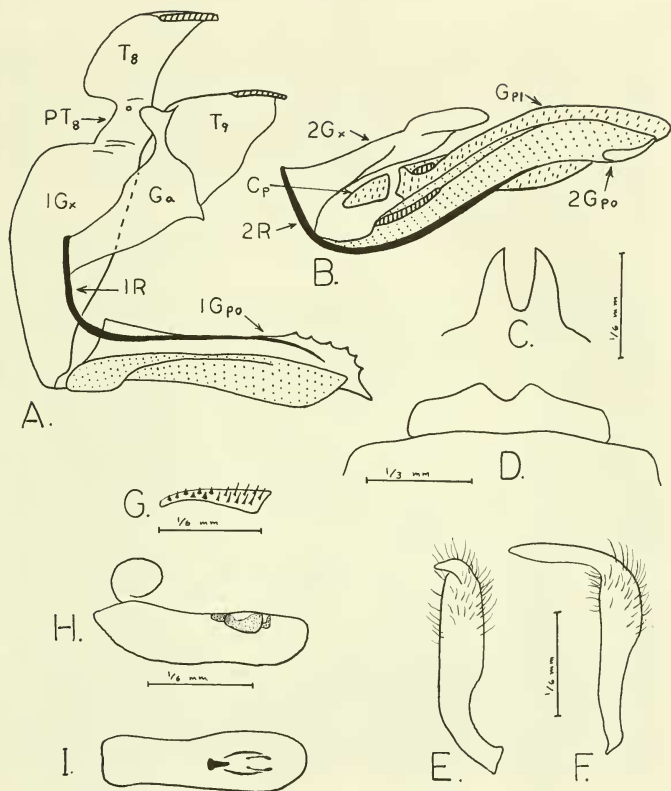


Fig. 1. *Enalosalda mexicana* (Van Duzee): (A) Female genitalia: T₈, tergite 8; T₉, tergite 9; PT₈, paratergite 8; Ga, gonangulum; 1 Gx, first gonocoxa; 1R, first ramus; 1 Gpo, first gonopophys. (B) Female genitalia: Gpl, gonoplac; 2 Gx, second gonocoxa; 2R, second ramus; 2 Gpo, second gonopophys; Cp, connecting piece. (C) Parandria. (D) Female subgenital plate. (E & F) Left male paramere, two views. (G) Male coupling plate. (H) Aedeagus, lateral view. (I.) Aedeagus, dorsal view.

Ovipositor short, broad, with six small teeth (Fig. 1A, 1 Gpo). Antennal proportions, I, 18; II, 40; III, 30; IV, 30.

Mean length of 10 ♂♂: 2.68mm (max 2.7; min 2.6)

Mean width of 10 ♂♂: 1.36mm (max 1.4; min 1.3)

Mean length of 10 ♀♀: 3.06mm (max 3.1; min 2.9)

Mean width of 10 ♀ ♀: 1.59mm (max 1.7; min 1.5)

MATERIAL EXAMINED.— 104 ♂ ♂, 66 ♀ ♀, 15 nymphs, San Carlos Bay, Guaymas, Sonora, Mexico, CL1202, 28-V-1966 to 5-VI-1966 (JTP); 9 ♂ ♂, 2 ♀ ♀, 3 nymphs, Ensenado Lalo, Sonora, Mexico, 27 56' 15" N x 111 17' 30" W, 29-X-1966, W. G. Evans. On high mid-tide rocks (JTP); 1 ♀, Angel de la Guardia Island, Gulf of Lower California, 29-VI-1921, E. P. Van Duzee (Holotype, CAS); 1 ♂, Pelican Point, Sonora, Mexico, 31 20' N, 113 38' W, on reef, water's edge, 27-III-1969, V. Roth (JTP).

The Ensenado Lalo and Pelican Point series were kindly furnished by the collectors, and I am indebted for the opportunity to study this material.

VARIATION.— The Ensenado Lalo series exhibits a greater variation in eunomy than the San Carlos series, with the brownish areas often less extensive but much darker where they occur, almost piceous. A very dark male has head markings darker, in the same pattern as the described male, but has the pronotum only narrowly margined with ochreous, the light area along the collar interrupted medially, and the remainder piceous; the scutellum is concolorous; the hemelytra are largely deep brownish black, with scattered light areas and broad elongate light area on the basal three-fourths of the outer corium interrupted medially by a weakly shining deep brown wedge; other markings similar to the described male, but the brown is darker.

In a female from the same series, the brown markings are deep as in the male, and the pattern is similar to the described male except the hemelytra, which are largely leucine to ochreous, with deep brown markings as follows: lightly shining spot on embolium and adjacent irregular contiguous spots on outer and inner corium one-fifth of the distance from base to apex; slight markings along claval commissure, and a tiny spot on clavus near apex of scutellum.

The veins delineating the cells of the membrane have a rather random pattern, creating from three to five irregularly shaped cells on each hemelytra (Fig. 2). This is true throughout all series.

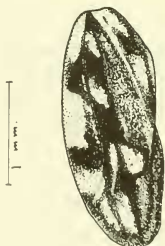


Fig. 2. *Enalosalda mexicana* (Van Duzee), left hemelytron.

HABITAT.— *Enalosalda mexicana* (Van Duzee) was found at San Carlos Bay in the intertidal zone on porous volcanic rock. The rock abounded with tiny pockets and crevices where the bugs hid when disturbed. None were observed feeding; however, it is presumed they utilize the abundant sea life clinging to the rocks. In June of 1966 the saldids made their appearance on the rocks as soon as the tide receded sufficiently for the surfaces to start drying, and were most abundant on dry rock. None were found where substantial spray was evident. The habitat seems restricted to the mid-tidal zone, where the full tide covers the rocks with several feet of water and low tide leaves several feet of rock exposed. All suitable areas along the rocky headland south of the trailer park near the Yacht Club at San Carlos Bay had abundant populations of the bugs, but a few miles distant in areas that appeared suitable none could be found. The rocky headland where the colonies are found is protected by a nearby island, which could be important since it protects the area from heavy seas.

When the low tide occurs at night, it will be interesting to determine whether or not the saldids feed, as most saldids are positively phototropic.

(In March of 1967 the habitat described above and another harboring this species on nearby Deer Island were examined. At this time of year the tide has little variation and is very low, so the saldids followed a pattern consisting of activity in sunlight and retreating to the rock crevices during darkness, the normal pattern of activity followed by littoral saldids.)

Ioscytus suttoni (Drake and Hussey), n. comb.

Saldula suttoni: Drake and Hussey, 1951, Occ. Papers Mus. Zool. Univ. Mich. 536:1-3 (Type: Michoacan, Mexico; Museum of Zoology, Univ. Mich.).

I have examined the type *Saldula suttoni* and find that it must be transferred to the genus *Ioscytus* because of the nature of the antennae, dorsal hairiness, pronotum, and general facies. The left hemelytron is shown in Fig. 5.

MATERIAL.— Mexico: 1♂ (Holotype), Michoacan, 26 km S Patzcuaro, under stones, 10,000 ft 2-III-1949. G. M. Sutton (UM).

Saldula saricola, n. sp.

Of moderate size, quite slender, general color black, macrop-terous. (For all measurements 60 units=1 mm.)

COLORATION.— Hemelytra dull black, barely shining; head, scutellum, thorax, and venter of abdomen deep brown to piceous, with golden pubescence on dorsum and fine silver pubescence on venter; spot on each side of vertex of head extending from hind margins of ocelli to eye, anteriorly diverging bands on each side of frons, outer corium anteriorly, spots on clavus and hemelytra yellowish; lateral pronotal margins whitish yellow, sharply be-

coming black anteriorly and posteriorly; embolium whitish yellow, becoming leucine posteriorly, there expanding to a large concolorous spot adjacent to membrane; clypeus and labrum ochroleucus; anterior and middle coxae margined with subhyaline; hind coxae acetabula, ventral segments of abdomen brown margined; outer corium yellowish anteriorly; inner corium with yellowish spot mediolaterally, two yellowish spots between the apex of the clavus and the membrane along hemelytral commissure. Narrow whitish yellow band or spot at apex of inner corium along anterior margin of membrane. Clavus with basal portion brownish yellow, and a yellowish spot near the apex. Legs hyaline to leucine, anterior femora brownish on apical four-fifths, middle and hind femora brownish on apical one-third, all femora light at apex; knees dark, middle and hind tibiae slightly embrowned over apical half, becoming lighter before apex which is brown.

HEAD.— Vertex raised medially in ocellar region; frons with median sulcus, and a cavity between the posterior portion and eye; a pair of conspicuous long black hairs on vertex, another pair on frons; rostrum brownish, extending between hind coxae.

THORAX.— Shining, faintly rugose, clothed with conspicuous golden pubescence; lateral margins straight, narrowing moderately anteriorly; callus strongly raised, with circular deep impression on each side; posterior lobe shorter than anterior lobe, midline ratio 8:13.

Scutellum about as wide as long (W, 51; L, 47).

WINGS.— Hemelytra fully developed, covered with scattered golden pubescence, the longest subequal to width of the hind tibia; membrane long, with four cells, clouded with ochreous to brown, veins darker. For the eunomy, see Figs. 3F, G, and H.

EXTREMITIES.— Antennae long, slender; segment 1 stoutest, testaceous; segments 2, 3, and 4 deep brown; all segments clothed with short, inconspicuous hairs; antennal proportions:

♂: I, 19; II, 44; III, 29; IV, 27.

♀: I, 20; II, 47; III, 31; IV, 30.

Tibiae with a few scattered dark spines.

GENITAL STRUCTURES.— Ovipositor of female with very stout, well-separated teeth on saw. Male paramere (Figs. 4C and D) clothed with fine hairs, filum gonopori coiled one and one-half times; coupling plate and parandria of male. (Figs. 4I and J.)

Holotype (♂): length 3.5 mm, width 1.4 mm.

Allotype (♀): length 3.7 mm, width 1.6 mm.

Mean length of 10 ♂♂: 3.28 mm (max 3.5; min 3.1)

Mean width of 10 ♂♂: 1.31 mm (max 1.4; min 1.3)

Mean length of 10 ♀♀: 3.76 mm (max 3.9; min 3.4)

Mean width of 10 ♀♀: 1.59 mm (max 1.7; min 1.5)

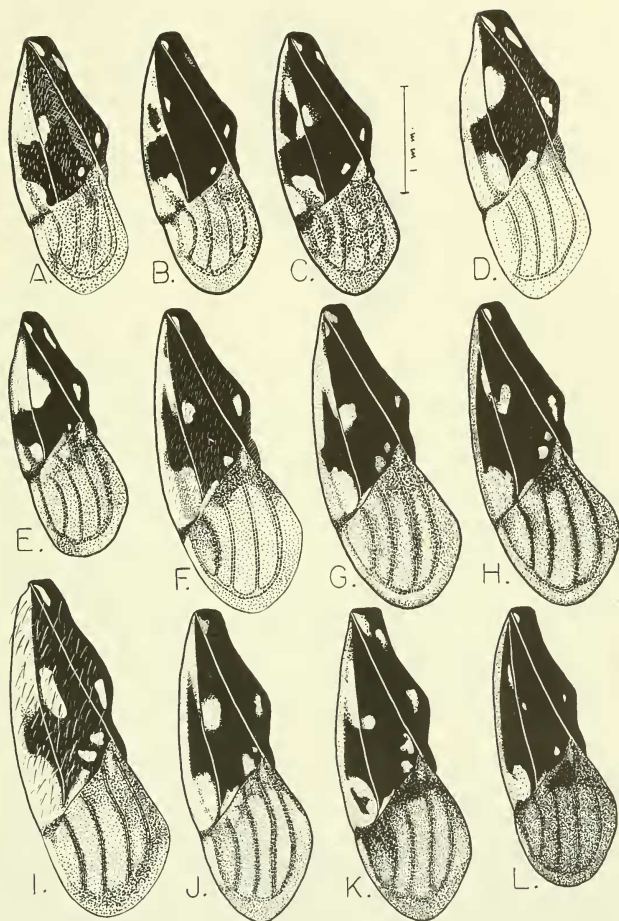


Fig. 3. *Saldula dewsi* group, hemelytra: (A, B, C) *Saldula abdominalis* (Champion). (D, E) *Saldula ventralis* (Stal). (F, G, H) *Saldula saxicola* n. sp. (I, J, K, L) *Saldula dewsi* (Hodgden).

MATERIAL EXAMINED.— Holotype ♂, allotype ♀, and paratypes 9 ♂♂ and 4 ♀♀, 5 miles (8 km) NE Castle Hot Springs, Arizona, CL 312, 7-X-1964 (JTP); 12 ♂♂, 16 ♀♀, 2 nymphs, Cuchajaqui Arroyo,

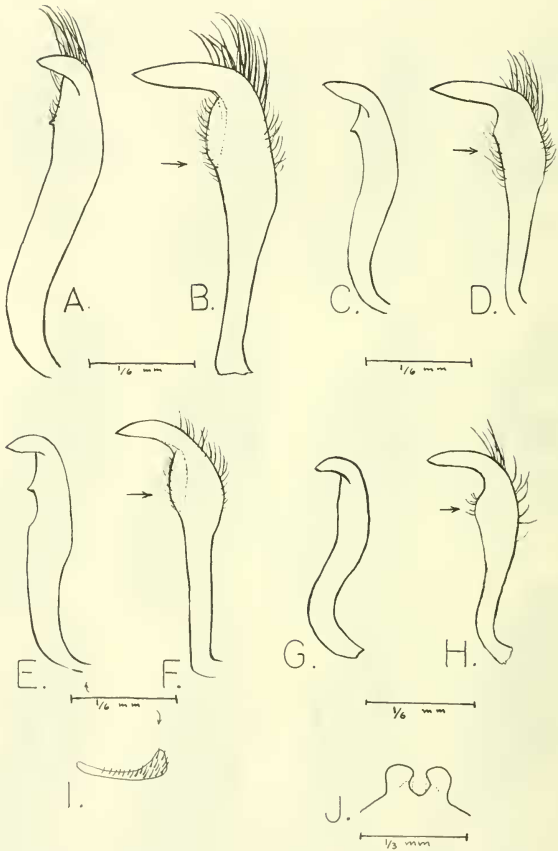


Fig. 4. *Saldula dewsi* group, genitalia: (A, B) *Saldula dewsi* (Hodgden), left male paramere, two views. (C, D) *Saldula saxicola* n. sp., left male paramere, two views. (E, F) *Saldula abdominalis* (Champion), left male paramere, two views. (G, H) *Saldula ventralis* (Stal), left male paramere, two views. (I, J) *Saldula saxicola* n. sp., male coupling plate (I) and parandria (J).

near Alamos, Sonora, Mexico, CL 1215, 21-III-1967, J. T. Polhemus (JTP); 6♂♂, 3♀♀, Cuchajaqui Arroyo, near Alamos, Sonora, Mexico, CL 1264, 29-V-1966, J. T. Polhemus (JTP); 4♂♂, 2♀♀, 1 mile (2 km) SW Ixhuatan, Chiapas, Mexico, CL 1098, 5-V-1964, J. T. and M. S. Polhemus (CU); 8♂♂, 2♀♀, 2 miles (3 km)

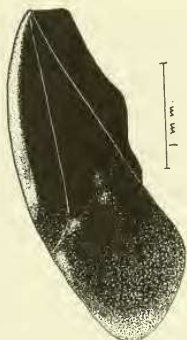


Fig. 5. Hemelytra: *Ioscytus suttoni* (Drake and Hussey), type.

NE Ixhuatan, Chiapas, Mexico, CL 1099, 5-V-1964, J. T. and M. S. Polhemus (CU); 6 ♂♂, 2 ♀♀, Santa Fe, Chiapas, Mexico, CL 1101, 5-V-1964, J. T. and M. S. Polhemus (CU); 3 ♂♂, 3 ♀♀, 3 miles (5 km) W El Naranjo, 1200 ft (367 m), San Luis Potosi, Mexico, 5-VI-1965, Burke, Meyer, and Schaffner (TAM); 1 ♂, Rio Quezalapan, 2 miles (3 km), E Lago Catemaco, Veracruz, Mexico, 21-VI to 5-VII-1964, J. R. Meyer (TAM); 1 ♂, Ciudad Victoria, Mexico, 14-VII-1950, Drake and Hottes (JTP); 1 ♀, Cola de Caballo, 3000 ft (917 m), Nuevo Leon, Mexico, 6-VII-1959, R. B. Selander and J. C. Schaffner (JTP); 1 ♂, Real de Arriba, Temascaltepec, Mexico, 4-VI-1933; H. E. Hinton and R. L. Usinger (JTP); 1 ♂, 22 miles W Ptazcuaro, Michoacan, Mexico, CL 1033, 23-IV-1964, J. T. and M. S. Polhemus (CU). Holotype, allotype, and paratypes in the University of Colorado Museum collection; paratypes will be deposited in the collections of Texas A & M University, California Academy of Sciences, and the author.

COMPARATIVE NOTES.— The most obvious external character separating *Saldula saxicola* from *S. dewsi* (Hodgden) is the long, hairy dorsal vestiture of *dewsi*. The male parameres are helpful in diagnosing the group, those of *dewsi* usually being larger, having a tuft of heavier black hairs (Figs. 4A and B), and a shape different from either *saxicola* or *Saldula abdominalis* (Champion).

Saldula saxicola was first recognized in the Arizona material and later additional specimens were found in the Mexican material being held under *abdominalis*. While the second antennal segment in some of the southern Mexico forms occasionally overlaps the proportions found in *abdominalis*, the eunomy will help to separate the two. The hemelytral markings in *abdominalis* (Figs. 3A, B, and C) tend to form an eye-shaped spot arising from the embolium at the forepart of the wing, whereas the tendency in *saxicola* is to form a solid fascia arising from the embolium, and in darker speci-

mens the light area draws away from the embolium and degenerates into a line parallel with it. Rarely is *saxicola* found without a line or thin spot of white in the inner corium along the anterior margin of the membrane, whereas this is lacking in *abdominalis*; and two white spots are often found close to the hemelytral commissure in *saxicola*, whereas never more than one is present in *abdominalis*. Also the fascia at the apex of the corium along the embolium is usually solid white in *saxicola*, and if darkening occurs it is in the center. In *abdominalis* this spot is usually U-shaped, open at the rear; as the eunomic series progresses, the lighter colored specimens have the U filled in with white, and the eye-shaped spot well developed.

In the northern populations (Arizona, Sonora, Tamaulipas) of *S. saxicola*, the ratio of the length of the second antennal segment to the width of the head through the eyes will easily separate them from *abdominalis*, as the ratio is .80 or more in *saxicola* and a maximum of .60 in *abdominalis*. In the southern specimens, however, the ratio varies widely even within a given series, and an occasional overlap is found. Of the 51 specimens of *saxicola* examined for this character, only 4 had ratios of .60 or less, the lowest being .57. Of the 21 specimens of *abdominalis* studied, only 4 had ratios of .57 or greater, the highest being .60. Of the 8 specimens in the overlap zone, none presented a great problem in separation because of the long series available to work out the eunomy of each species.

HABITAT.— In Arizona, *S. saxicola* was found on exposed sloping sandstone in a streambed. The water was seeping from the base of an abandoned dam, wetting the roughly sculptured rock surfaces and forming pools where *Trepobates becki* Drake and Harris was abundant. On the more steeply sloping damp surfaces, *S. saxicola* was collected, along with *Saldula pexa* Drake.

At Cuchajaqui Arroyo, Mexico, the specimens were found in a similar habitat, on vertical stone surfaces beside a stream flowing into a large vertical-walled, sandstone basin and on a large log in the stream. Other locations in Mexico produced *saxicola* from similar situations, the specimens almost always being found on vertical or steeply sloping damp stone surfaces.

DISTRIBUTION.— In the *Saldula dewsi* species group, *S. abdominalis*, *S. dewsi*, *S. saxicola*, and *Saldula ventralis* (Champion) are found in Mexico. *S. ventralis* is the southernmost component of these and is not easily confused with the others. *S. dewsi* is found in Arizona, Mexico, and Central and South America, roughly paralleled in distribution by *S. abdominalis*; but the latter has not been found north of Central Mexico. *S. saxicola* apparently has its distributional center in Mexico and ranges into Arizona.

Saldula durangoana, n. sp.

Moderately large, robust; general color black and light brown, macropterous. (All measurements: 60 units = 1 mm.)

COLORATION.— Hemelytra dull black, not shining; head, scutellum, thorax, and venter of abdomen black, covered with fine decumbent golden pubescence on dorsum and thick silver pubescence on venter; clypeus, labrum, rostrum testaceous to brownish; anterior and middle acetabulae, coxae, ventral abdominal segments posteriorly margined with subhyaline; base of embolium, corium next to clavus, two medial elongate spots between corium and embolium, and small spot at apex of embolium deep brown to black; remainder of corium and embolium luteous, inner corium lighter at median corial suture, outer corium subhyaline. Clavus black, with fine golden pubescence, apex with faint brownish area. Legs testaceous to ochreous, anterior and middle femora blackish beneath on apical three-fourths, posterior femora blackish beneath on apical half, femora ochreous basally, with brownish spots on sides.

HEAD.— Shining with scattered long hairs on vertex and frons. Vertex with usual small yellow spot between ocelli and eye on each side, faintly rugose; ocelli large, separated by approximately the width of an ocellus. Rostrum extending between hind coxae.

THORAX.— Pronotum moderately shining, faintly rugose, clothed with long, erect, black hairs that are not obvious unless viewed from the side, except a few along the anterior lateral margins; lateral margins curved, slightly explanate, narrowing moderately anteriorly. Callus moderately raised with a deep circular median impression; posterior lobe shorter than anterior lobe (not including collar), mid-line ratio 12:14, length to width ratio 30:103. Anterior and middle acetabula, coxae margined with subhyaline. Scutellum as wide as long (70:70).

WINGS.— Hemelytra fully developed, dull, not shining, with scattered golden pubescence, a little thicker at the base of the embolium, entire dorsum except membrane clothed with long, erect, black hairs. Membrane faintly brownish, subhyaline, veins slightly darker; long, with four cells (Fig. 6).

EXTREMITIES.— Antennae moderately long, moderately stout; segment 1 stoutest, testaceous, dark brown beneath on apical three-fourths; segment 2 longest, dark brownish yellow, lighter on apical third, apex dark; segments 3 and 4 black, somewhat thicker than segment 2; thicker than hind tibia; all segments clothed with semi-short pubescence, longer on segments 1 and 2, scattered longer stiff hairs on segments 3 and 4; antennal proportions:

♂: I, 18; II, 34; III, 24; IV, 30

♀: I, 18; II, 43; III, 26; IV, 30

Tibia covered with short, depressed hairs, none obviously longer than diameter of tibia, and usual dark spines; femora with longer, thin hyaline hairs beneath.

GENITAL STRUCTURES.— Male paramere (Figs. 7A and B) stout, clothed with long, fine hairs. Parandria as shown in Fig. 7C.

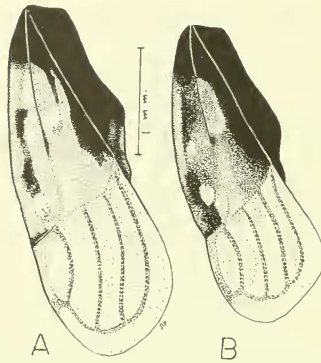


Fig. 6. *Saldula durangoana* n. sp.: (A, B) hemelytra.

Holotype (♀): length 4.5 mm; width 2.1 mm.

Allotype (♂): length 3.8 mm; width 1.7 mm.

Paratype (♀): length 4.2 mm; width 2.0 mm.

ALLOTYPE.— The allotype (male) darker than holotype; outer corium mostly brown to dark brown with a white spot medially at the apical four-fifths.

MATERIAL EXAMINED.— Holotype (♀) and paratype (♀), 39 miles W Durango, Durango, Mexico, CL 1013, 20-IV-1964, J. T.

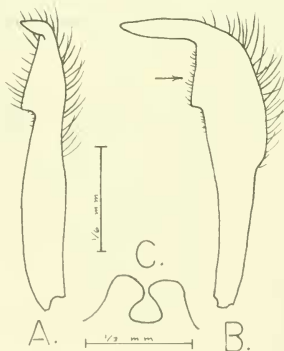


Fig. 7. *Saldula durangoana* n. sp.: (A, B) Left male paramere, two views. (C) Parandria.

and M. S. Polhemus. Allotype (σ), 61 miles W (99 km) W Durango, Durango, Mexico, CL 1014, 20-IV-1964, J. T. and M. S. Polhemus. (The holotype and allotype are in the University of Colorado Museum, and the paratype in the Polhemus collection.)

COMPARATIVE NOTES.—The species most closely resembles *Saldula luctuosa* (Stål) but *luctuosa* has a faintly shining to shining hemelytra, while *durangoana* is dull. This species bears a slight resemblance to *Saldula andrei* Drake; however, *andrei* is a narrower species with polished shining scutellum and pronotum, straight lateral pronotal margins, and a tendency for the apical spot on the clavus to form a fascia.

HABITAT.—Taken from amongst the grasses at two locations, one a grazing meadow, the other a margin of a farm pond. At both locations the ground was very wet. The elevation here is approximately 2000 m (6500 ft).

Saldula sulcicollis hispida (Hodgden), n. comb.

Saldula hispida Hodgden, 1949, J. Kansas Ent. Soc. 22(4):115-156 (Type: Temescaltepec, Mexico; Calif. Acad. Sci.)

The comparison of the type of *Saldula hispida* (Hodgden) with a long series of *Saldula sulcicollis* (Champion) from various locations ranging from Arizona to Costa Rica has revealed that *hispida* cannot be considered more than a subspecies of *sulcicollis*. Specimens from the high mountains of Northern Chiapas in Mexico agree well with the type of *hispida*, and a male has been designated as typical of the subspecies and is described below.

In the series of *sulcicollis* from San Cristobal las Casas, Chiapas, specimens vary from the typical form almost to the *hispida* form in antennal dilation and coloration, which are the only reliable characteristics which will separate the two. In the typical form of *sulcicollis*, the last two antennal segments are slightly swollen and the apical half of the fourth segment is light colored, whereas in the *hispida* form the antennal segments are more slender and the last segment concolorous. The male genitalia of the two forms agree perfectly, and the other characters used by Hodgden for separation are too variable to be reliable.

As the type of *hispida* is from Real de Arriba (about 7000 ft) and the Chiapas material of *hispida* is from about the same altitude, it seems that this subspecies is restricted to the higher elevations, while the typical subspecies inhabits the valleys and plains from about 3000 to 5000 ft (900 to 1500 m) elevation. Very recent collections in Guatemala also support this view.

DESCRIPTION OF MALE.—Of moderate size, general color deep brown to black, macropterous, entire dorsum (except membrane) covered with long, erect setae, and semilong sparse golden pubescence. (For all measurements, 60 units = 1 mm.) Length 4.5 mm, width 1.8 mm.

COLORATION.— Hemelytra black to deep chocolate brown with pruinose and leucine markings; head, scutellum, thorax, and venter of abdomen black; small spot between ocelli and each eye, clypeus, anteclypeus, labrum ochreous; rostrum flavous to ochreous; clavus velvety black, with bluish pruinose areas at base, middle and near apex, narrow area at suture shining; inner corium pruinose black basally, pruinose area terminating in whitish grey at basal one-fourth; small whitish spot medially, whitish pruinose area next to membrane at middle; remainder shining black; outer corium blackish brown basally, becoming translucent deep chocolate brown apically, with leucine spot at apical fourth on embolium; legs ochreous to leucine; femora medially darkened, lighter at base and apex, with usual brown spots; tibia dark at knees, apex and broad medial area darkest on anterior legs, leucine elsewhere; tarsi with first segment largely leucine, second segment darker; coxae leucine, dark basally.

HEAD.— Shining, frons and vertex rugulose. Rostrum reaching between hind coxae; frons slightly depressed longitudinally at middle; ocelli approximate, slightly elevated. Eyes large, extending laterally half their width beyond anterior pronotal margins, with scattered setae.

THORAX.— Pronotum rugulose, shining callus strongly raised, with deep medial depression and a tiny, shallow depression on each side of the medial pit, marked off from collar and posterior lobe by deep, pitted sulci; collar wide (5); anterior lobe longer than posterior lobe (17/11); lateral margins slightly concave; humeral angles

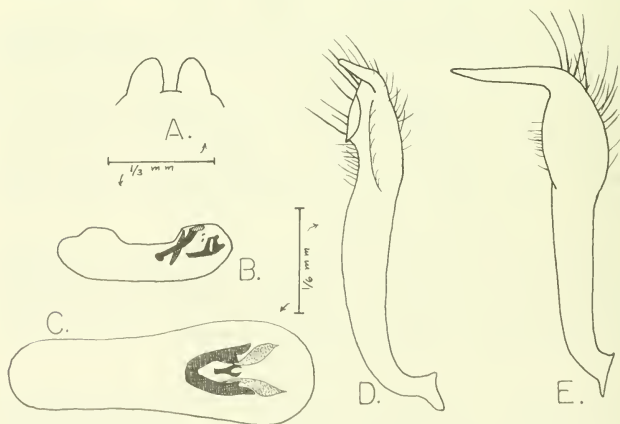


Fig. 8. *Saldula sulcicollis* (Champion), male genitalia: (A) Parandria, (B, C) Aedeagus, lateral view (B) and dorsal view (C). (D, E) Left male paramere, two views.

sharply rounded; posterior margin broadly convex; posterior width/ anterior width, 88/45. Scutellum rugulose, shining; width/length, 58/62.

WINGS.— Hemelytra fully developed; membrane fumose, with whitish mottling, veins dark, outer margin shining brown basally and apically, leucine medially, with four cells.

EXTREMITIES.— Antennal segment 1 ochreous, with small brownish anterior spot; segment 2 ochreous, brown at apex, slender; segments 3 and 4 dark brown, subequal in diameter to segment 1; segments 1 and 2 clothed with semilong hairs and scattered long hairs, segments 3 and 4 clothed with short pubescence and scattered longer hairs; proportions, I, 23; II, 54; III, 36; IV, 41. All leg structures covered with short, fine, light-colored pubescence; femora with long hairs beneath.

GENITAL STRUCTURES.— Parandria, paramere, and median sclerotized structure of aedeagus as shown in Fig. 8; filum gonopori coiled two and one-half times.

MATERIAL EXAMINED.— 7 ♂♂, 2 ♀♀, Mexico, Chiapas, 5 miles (8 km) S Tapiula, CL 1095, 4-V-1964, J. T. and M. S. Polhemus (CU); 1 ♂, 1 ♀, Chiapas, 12 miles (19 km) N Bochil, CL 1091, J. T. and M. S. Polhemus (CU).

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